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MEDICAL NEWS LETTER

Editor - Captain L. B. Marshall, MC, USN (RET)

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AVIATION MEDICINE DIVISION

Policy

The U. S. Navy Medical News Letter is basically an official Medical Department publication inviting the attention of officers of the Medical Department of the Regular Navy and Naval Reserve to timely up-to-date items of official and professional interest relative to medicine, dentistry, and allied sciences. The amount of information used is only that necessary to inform adequately officers of the Medical Department of the existence and source of such information. The items used are neither intended to be nor susceptible to use by any officer as a substitute for any item or article in its original form. All readers of the News Letter are urged to obtain the original of those items of particular interest to the individual.

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Notice

Due to the critical shortage of medical officers, the Chief, Bureau of Medicine and Surgery, has recommended and the Chief of Naval Personnel has concurred that Reserve medical officers now on active duty who desire to submit requests for extension of their active duty for a period of three months or more will be given favorable consideration.

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Medical Care for U. S. S. Bennington Casualties

Rear Admiral Lamont Pugh (MC) USN, the Surgeon General, flew to Quonset Point, R. I., early on Thursday, 27 May 1954 to personally observe the medical measures instituted to care for the many severe casualties from the U. S. S. Bennington disaster.

Upon his arrival at Quonset Point, Admiral Pugh was flown by helicopter to Newport where he conferred with Captain John L. Enyart (MC) USN, Commanding Officer of the Naval Hospital and members of his staff.

After visiting the casualties at the Naval Hospital, Newport, and the Infirmary, Quonset Point, Admiral Pugh stated that he was highly pleased with the expeditious manner in which all medical means in the Newport area were coordinated to relieve the suffering of the many Bennington casualties and he praised the fine teamwork shown by all personnel and units concerned with the treatment of the casualties. He said that, "except for the wholehearted cooperation of Atlantic Fleet units in the Newport harbor and the immediate response from all shore-based activities in that area, more lives might have been lost."

Admiral Pugh was high in his praise of the foresightedness shown in the recent placing of medical supply items for area distribution in the Naval Supply Depot at Newport. Such stored items included intravenous solutions,

tracheotomy tubes, syringes, and other items urgently required in a disaster of this type. He said that the restrictions currently in force concerning the stock levels of medical supplies at medical activities could have been the cause of a vital shortage of critical medical items at this time of great need. He added that the immediate availability of saline solution and other intravenous solutions in the Medical Supply Section of the Naval Supply Depot at Newport obviated the necessity of procuring additional medical items from New York.

Admiral Pugh was accompanied on his trip by Rear Admiral Winfred P. Dana (MC) USN, Assistant Chief for Aviation and Operational Medicine and Assistant Chief for Research and Medical Military Specialties, Bureau of Medicine and Surgery; Captain W. Leona Jackson (NC) USN, Director of the Navy Nurse Corps; and Lieutenant Commander Roy T. Brooks (MSC) USN, the Surgeon General's Executive Assistant. (TIO, BuMed)

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Residency Training Policy for Reserve Medical Officers on Active Duty

A forthcoming BuMed instruction will prescribe the Department of Defense policy with respect to residency training programs for medical officers of the Regular Navy and U. S. Naval Reserve.

1. In addition to medical officers of the Regular Navy, Reserve medical officers who are on active duty, and who have completed their obligations for active duty imposed by the Universal Military Training and Service Act, as amended, are now eligible to compete for assignment to residency training in naval hospitals, in those specialties in which there exists a definite shortage at the time of application for such training.

2. At the present time shortages exist in the residency training program in the following specialties: Anesthesiology, Otolaryngology, Ophthalmology, Pathology, Orthopedics, Obstetrics and Gynecology, Pediatrics, and Urology.

3. Eligible and interested Reserve medical officers should make application to the Bureau of Medicine and Surgery, via the chain of command. Letters of application should contain an agreement to volunteer for the period of residency training requested, and to remain on active duty in the Navy for a period of 1 year following completion of the training, for each year of training received. In general, the Bureau prefers to approve officers for residency training on a year-to-year basis.

4. From time to time the list of medical specialties in which shortages exist will be revised and brought up to date, to reflect the then existing needs. (ProfDiv, BuMed)

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Hemorrhagic Fever

Hemorrhagic fever is considered to be an acute infectious disease, probably of viral or rickettsial origin, characterized by fever, headache, backache, abdominal pain, an erythematous flush, conjunctival and palatal injection, hemorrhagic manifestations, vasomotor instability, albuminuria, and renal insufficiency.

At present the etiology is unknown. Epidemiologically and clinically, however, hemorrhagic fever behaves like an infectious disease.

The disease has a seasonal incidence with spring and fall outbreaks. Although sporadic cases occur throughout the year the case rate rises in May, reaches a peak in June, then declines during the summer months. In October the case rate again rises precipitously and reaches its height in November. During December the case rate falls and cases are infrequent during the late winter and early spring.

In Korea, it has been predominantly a disease of front-line troops and it occurs most commonly in personnel whose duties require them to work in grassy and scrub terrain. Small focal outbreaks are seen; for example, 3 or 4 cases may occur in 1 squad while the remainder of the company escapes unaffected. This type of case distribution suggests a nonflying insect vector. There is no evidence of person-to-person transmission..

These observations support the Japanese and Russian claims that the disease is mite-borne. Trombiculid mites are suspected though no specific species has been incriminated by American entomologists. At any rate, the bite of the vector does not produce local irritation and there is no eschar.

Foreign literature indicates a reservoir of inapparent infection in field rodents, particularly Apodemus agrarius. To date, this observation has not been confirmed by United Nations investigators.

The incubation period is usually from 2 to 3 weeks but information from analysis of cases moving into and out of the endemic area indicates it may range from 7 to 35 or more days.

Hemorrhagic fever varies greatly in severity but the majority of patients follow a relatively typical course. This course, for descriptive purposes, is best divided into 4 phases. The disease begins with fever and nonspecific constitutional symptoms, the febrile phase. In 3 to 5 days the temperature falls and at this time many patients show 12 to 36 hours of hypotension. This hypotensive phase is followed by 3 to 5 days of oliguria and azotemia, and terminates in a diuresis, which initiates the prolonged convalescent phase. The hemorrhagic manifestations begin in the febrile phase, reach their maximum during the hypotensive period and usually disappear while the patient is still oliguric.

At present there is no specific diagnostic test for hemorrhagic fever. The diagnosis is therefore based on the sum of clinical and laboratory

findings. At the 8th Army Hemorrhagic Fever Center in Korea the following criteria are thought to be essential: (1) clinical history and physical findings consistent with hemorrhagic fever; (2) hemorrhagic manifestations; and (3) renal damage evidenced by albuminuria, oliguria, and loss of renal concentrating ability.

Although milder cases which do not meet these criteria probably occur, they cannot be diagnosed at present.

Diseases most commonly confused with hemorrhagic fever are malaria, upper respiratory infections, infectious mononucleosis, relapsing fever, gastroenteritis, infectious hepatitis, and meningitis.

Complications are largely due to the hemorrhagic tendency and overhydration. Hematemesis, melena, pulmonary edema, intrapulmonary hemorrhage, gross hematuria, severe epistaxis, and intracranial hemorrhage may occur. Bronchopneumonia and pulmonary abscesses are common in cases terminating late in the disease, and ruptured spleen, hemorrhagic pancreatitis, bacterial parotitis, and cerebral abscess have been encountered. Because of the high incidence of pulmonary pathologic changes in late fatal cases, respiratory complications should be guarded against and promptly treated.

Serious prognostic signs are prolonged high fever, early appearance of shock, severe hemorrhagic manifestations, rising temperature during shock, failure of a lymphocytosis to appear, marked leukocytosis, and severe electrolyte disturbances. Residua are rare and there have been no proved recurrences.

At present there is no specific therapeutic agent for hemorrhagic fever. Management is based on careful fluid restriction, bed rest, and sedation. Fluid limitation is based on 2 observations: (1) overhydration increases abdominal pain and vomiting; and (2) excessive fluid may lead to pulmonary edema. The presence of conjunctival or periorbital edema, vomiting, or severe back pain indicates overhydration and fluid intake is limited. In many patients this produces a moderately negative water balance but improvement in symptoms is prompt and dehydration is well tolerated. On the other hand, when overhydration is not a clinical problem, fluids may be allowed to the point of equaling urine output plus insensible water loss. When the capillary damage is repaired during oliguria, the edema is reabsorbed and during the remainder of the renal phase the patient is kept in normal fluid balance. With the onset of diuresis negative water balance must be avoided and it is therefore often necessary to force fluids.

It has been amply demonstrated that keeping hemorrhagic fever patients quiet lessens bleeding, vomiting, shock, and morbidity. Therefore, prompt air evacuation, strict bed rest, and adequate sedation are routinely employed. Because it is both analgesic and hypnotic, meperidine hydrochloride has been of great value and is used liberally, even when pain is

minimal. This drug relieves headache, backache, abdominal pain, vomiting, and hiccoughs, and produces sleep.

Alcohol sponges, ice packs, and small doses of antipyretics are used to control hyperpyrexia, but large doses of acetylsalicylic acid, which may precipitate sudden defervescence, are avoided.

Management of the hypotensive phase is directed at maintaining an effective blood pressure without overhydrating the patient until the integrity of the cardiovascular system has been restored. The Trendelenburg position and the use of elastic bandages on the lower extremities are effective and these measures alone will control mild to moderately severe cases of shock. Vasoconstrictors are helpful and are used repeatedly during this phase in order to maintain an effective blood pressure. Concentrated human serum albumin (salt poor) is of value in severe shock, because it increases intravascular osmotic pressure, drawing fluid into the vascular system and reducing hemoconcentration. It loses its effectiveness after repeated use, however, presumably because it leaks into the tissues itself. Human plasma has been used but this requires larger quantities of fluid resulting in increased edema. Whole blood may be effective, but it has the same disadvantages, and, in addition, adds a potentially dangerous amount of potassium in the face of renal shutdown. Apprehension and hyperventilation during shock are difficult to manage. Constant reassurance and small quantities of sedatives are beneficial.

Therapy during the oliguric phase is essentially that of acute renal insufficiency from any cause. Careful fluid and electrolyte balance is maintained. As high a caloric intake as possible is indicated to reduce endogenous protein catabolism; 30 to 50% glucose solution is useful for this purpose. Diet also should be high in carbohydrate and fat but low in protein, sodium, and potassium. Large amounts of supplementary calcium are given to correct hypocalcemia. The temporary response of hyperkalemia to calcium, hypertonic glucose, and insulin will sometimes tide the patient over until diuresis begins. Cation exchange resins and hemodialysis (artificial kidney) have been employed in a few cases.

Except for maintaining adequate fluid and electrolyte intake, little therapy is needed after diuresis begins. Because early ambulation slows recovery, it is important to keep patients in bed until azotemia and albuminuria have disappeared. At this time gradual ambulation may be permitted. The rare fluid and electrolyte abnormalities during diuresis are best handled on an individual basis.

Preventive measures are directed at the mite. Dipping clothes after every 2-3 washings in dibutylphthalate and/or benzylbenzoate, use of insect repellent on the boot tops, belt line, and hands, and avoiding areas of heavy underbrush whenever possible, are measures believed to be effective in prophylaxis. There is no immunizing agent available at present. (Mil. Surgeon, Suite 718, 1726 Eye St. N. W., Washington 6, D. C., June 1954; W. H. Kessler, M. D., W. F. Ganong, M. D., and Col. C. L. Leedham, MC, USA)

Thrombocytopenic Purpura

This article presents a brief discussion of idiopathic thrombocytopenic purpura, dwelling chiefly on the all-important matter of differential diagnosis, and presents a group of illustrative cases from this institution. Idiopathic thrombocytopenic purpura is defined as a clinical syndrome of undetermined etiology, characterized by hemorrhagic phenomena, thrombocytopenia, prolonged bleeding time, normal clotting time, defective clot retraction, increased capillary fragility, and normal or increased numbers of megakaryocytes in the bone marrow.

The differential diagnosis of idiopathic thrombocytopenic purpura must include consideration of the entire group of hemorrhagic disorders, especially those conditions in which thrombocytopenia and hemorrhage are the result of a demonstrable pathologic process. Patients with secondary or symptomatic thrombocytopenic purpura may also present hemorrhagic phenomena, thrombocytopenia, increased bleeding time, and prolonged clot retraction, but, in addition, a primary cause for these findings may be found by a thorough review of all available historical, physical, and laboratory data. History of an infectious process in the recent past, exposure to toxic drugs or chemicals, or allergies may indicate secondary thrombocytopenia. Generalized lymphadenopathy, hepatomegaly, or splenomegaly, not usually found in idiopathic thrombocytopenic purpura, may be present. Examination of the peripheral blood may disclose in addition to thrombocytopenia, other findings such as anemia, leukocytosis, leukopenia, or leukocytic immaturity. There may be bone marrow abnormalities such as cancerous cells, fibrosis, hypoplasia, or "toxic changes." "Hypersplenic" disorders (if separated from idiopathic thrombocytopenic purpura) may show megakaryocytosis, but this abnormality may be accompanied by general bone marrow hyperplasia including the granulocytic and erythrocytic series, with similar depression of these formed elements in the peripheral blood. It is realized that present-day methods of diagnosing this disorder are far from adequate, and the distinction of idiopathic thrombocytopenic purpura from "hypersplenism" may be largely superficial. It is probable that the disorder is a form of "hypersplenism" in which only one element of the bone marrow, the megakaryocyte and its product, the circulating platelet, may be affected.

Supportive therapy should be considered the first principle of management of idiopathic thrombocytopenic purpura. This includes restriction of activity and supplementary iron, if anemia due to iron deficiency is present. If there has been severe bleeding or if shock is imminent, transfusions may be indicated.

If the symptoms are mild, the patient should be treated expectantly in the hope of a spontaneous remission; if severe, with manifestations of generalized bleeding such as cerebral hemorrhage, splenectomy should be considered an emergency measure. If the manifestations are continuously pres-

ent or recur over a sufficiently long period, splenectomy should be considered. (North Carolina M. J., May 1954, G. A. Anderson, M. D. and R. W. Prichard, M. D.; North Carolina Baptist Hospital, Winston-Salem, N. C.)

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Medical Treatment of Cardiospasm

The etiology of cardiospasm can be classified into two main categories, namely, external and internal factors. External factors consist of disturbances from sources extraneous to esophagus and cardia, causing cardiospasm by reflex. Internal factors consist of disturbances in the esophagus and cardia and their innervation (achalasia).

It is possible that a reflex disturbance causing cardiospasm, such as may originate from gallbladder disease, appendicitis, et cetera, can lead to achalasia by the following sequence of events. In the presence of reflex cardiospasm, stasis of food, fermentation, and infection may occur and produce considerable irritation of the mucous membranes of the esophagus, with esophagitis, erosions, ulcers, et cetera. The irritation of the esophagus may set up local reflexes to the cardia, and a vicious circle may result from distant and local reflexes. In the course of time, inflammation may produce degeneration of intrinsic plexuses, aided by pre-existing or secondary vitamin deficiency.

There are short reflex arcs along the entire gastrointestinal tract, and sensory receptors probably are in the mucous membranes. The possible presence of axon reflexes in the gastrointestinal tract has to be considered, which could produce spasm of smooth muscle and dilatation, stasis and exudation from capillaries and arterioles.

Local reflexes from an irritated lower esophagus which may produce or abet achalasia, may be interrupted by local application of surface anesthetic drugs. Distant reflexes which may produce cardiospasm, such as from peptic ulcer, diaphragmatic hernia, gallstones, et cetera, can be abolished by interrupting the reflex with spasmolytic drugs; in other words, if spasm in the duodenal bulb or in the bile passages is abolished, reflex cardiospasm would disappear.

On the basis of the above considerations and the results of their experiments, the authors treated cases of cardiospasm by oral administration of topical anesthetic drugs. The drugs were dissolved either in syrup or in carboxymethylcellulose, to maintain contact with the surface and prolong the local effect. Also, the viscid solution prevented undue diffusion of the drug on the oral mucosa, thus avoiding numbness of the tongue and buccal surfaces.

The authors were encouraged in their work by the appearance of a new drug which has both spasmolytic and topic anesthetic properties, and pos-

sesses such a degree of tolerance that even large doses did not produce undesirable reactions. This drug is JB 305 (Dactil), N-ethyl-3-piperidyldiphenylacetate hydrochloride. In tests in animals and man, it was found to possess low toxicity and rapid onset of action, and it has been used safely in patients.

Two criteria were used for effectiveness of the drug in cases of cardiospasm. First, control x-ray films with barium suspension were taken, and the emptying time of the barium into the stomach was recorded. A day later, JB 305 in solution was administered, barium was given immediately thereafter, and x-ray films were taken 5 and 10 minutes later. The second criterion was based on subjective effectiveness, that is, the patient's response.

The authors report results in 4 successive cases, because medical therapy in cardiospasm so far has been discouraging. The clinical results in their cases were such, that they feel justified in reporting them, so that JB 305 can be evaluated clinically on a larger scale. In cases of cardiospasm, topic anesthetic-spasmolytic drugs seem to take effect by various mechanisms. They abolish local pain, they abolish local reflexes, and they act as anticholinergic spasmolytic agents.

It is possible that local anesthetic-spasmolytic drugs can be employed in the treatment of other conditions, such as functional bowel obstruction, their use in the treatment of gastric ulcer and pylorospasm has been reported but has not been widely accepted.

Recently, the authors observed 4 cases of cardiospasm in which cancer of the upper part of the stomach was found later. Apparently, carcinoma of the stomach can produce cardiospasm by irritation and reflex, in the absence of infiltration of the cardia. In these cases, x-rays did not demonstrate the malignancy until long after cardiospasm had been noted. This experience should warn of the possibility of cancer of the stomach in cases of cardiospasm and repeated clinical and laboratory examinations should not be delayed. In such cases, success of medical treatment of cardiospasm would lull both patient and physician into a sense of false security. (Am. J. Digest. Dis., May 1954, H. Necheles, M. D., Ph. D., H. Laski, M. D., L. D. Elegant, M. D., and R. Baum, M. D.; Michael Reese Hospital, Chicago, Ill.)

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Treatment of Amebiasis

During 1953, the authors treated 24 patients who had chronic amebiasis with Win 5047 (Mantomide) (N-(2-4-dichlorobenzyl)-N-(2-hydroxyethyl) dichloracetamide). The diagnosis was established by finding cysts of Endamoeba histolytica in fecal smears or SAEX concentrations which were confirmed by iron-hematoxylin stained fecal smears. Post-treatment specimens of feces were obtained and similarly examined for cysts of E. histolytica,

2, 4, and 6 days, and then weekly during a minimum of 6 weeks after treatment was completed. This discretionary 6 weeks' period of post-treatment observation was selected in order to reduce the possibility of reinfection. Actually, most of the patients were examined for periods of more than 6 weeks.

In all of the cases the patients were considered to have chronic amebiasis. Inasmuch as most of these cases also had other intestinal parasites, the authors did not attempt to evaluate the efficacy of treatment on the basis of symptomatology. The results of microscopic examination of the feces were regarded as more precise criteria for evaluation.

No evidence of toxicity or intolerance was noted in any patient. This confirmed the extremely high tolerance exhibited by laboratory animals in acute, subacute, and chronic toxicity studies.

As a result of these preliminary clinical studies, it is apparent that Win 5047 is highly effective in eliminating E. histolytica cysts from the feces in cases of chronic amebiasis.

The dose of Win 5047 was calculated according to the age of the patient; to those less than 5 years, doses of 250 mg. were given 3 times daily for 8 days; to those between 5 and 10 years, 500 mg. were given 3 times daily for 10 days; and to patients over 10 years, 750 mg. to 1.0 gm. were given for 10 and 8 days, respectively.

Inasmuch as Win 5047 is inexpensive, it might be used in highly endemic areas, where in therapeutic doses or as a prophylactic it might serve as a superior means of controlling amebiasis together with improved insulation of water and food supplies from fecal contamination. (Antibiotics and Chemotherapy, May 1954, E. H. Loughlin and W. G. Mullin, Flower and Fifth Avenue Hospitals, New York, N. Y.)

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Sarcoidosis With Involvement of the Nervous System

Since Boeck in 1899 first described the skin lesions that have since come to bear his name, a large number of accounts of the disease have appeared in the literature. The disease is known by a variety of names, of which sarcoidosis, benign lymphogranulomatosis, and Besnier-Boeck-Schaumann disease are the most common. The condition described by Heerfordt under the title of "febris uveo-parotidea subchronica," later known as Heerfordt's syndrome, has now come to be recognized as a special manifestation of the same disease.

The etiological agent is unknown. Many features of the disease suggest that it is due to a chronic infection. The relation of sarcoidosis to tuberculosis has been intensively studied. The etiological hypotheses have recently been reviewed by Rostenberg. Reports from the literature and experiences in the present series make it clear that there are no signs and

symptoms which can be said to be pathognomonic of sarcoidosis and that variable clinical pictures, referable to the organs and tissues involved, must be expected. Some authors distinguish a meningitic, an encephalitic, and a polyneuritic type of sarcoidosis. This is a very crude and superficial method of classification, and many clinicopathological pictures cannot be grouped under these designations.

Involvement of the nervous system in cases of sarcoidosis is considered to be comparatively rare, occurring in 1 to 5% of all cases. The incidence is probably somewhat higher if cases which lack clinical manifestations but exhibit slight abnormalities in the cerebrospinal fluid are taken into account.

The disease may involve any part of the nervous system. Facial paresis is one of the most common signs and often is recurrent. The central nervous system may develop encephalitis, meningitis, or encephalomyelitis or may exhibit localized infiltration by sarcoid lesions, predominantly in the basal structures of the brain. These conditions may be manifested clinically by generalized or focal disturbances of cerebral function. Diabetes insipidus, arising from invasion of the pituitary gland, is not uncommon.

Nine cases of sarcoidosis with manifestations of nervous system involvement are reported. In 7 of the patients neurological symptoms constituted the initial complaint. Of special interest are 2 patients who exhibited a picture of cerebral tumor. In one of them there was fairly rapid clinical regression of the symptoms, confirmed by the encephalogram. The other had a granulomatous, tumorlike mass arising in the choroid plexus and blocking the inferior horn of the right lateral ventricle, necessitating surgical intervention. Ocular lesions were present in 5 patients, in 3 of them in the form of uveitis. The literature shows that the incidence of uveitis is four times as frequent in patients with as in patients without signs of nervous system involvement.

The patients in the present series were followed for an average period of 5 years, during which the neurological symptoms either disappeared completely or showed marked regression. One patient died of intermediate diseases during this period.

Reports in the literature show that, although the prognosis in sarcoidosis is usually good, it is comparatively poor in patients with symptoms of nervous system involvement. (Arch. Neurol. & Psychiat., May 1954, O. Höök, Neurological Clinic, Serafimerlasarettet; Stockholm, Sweden)

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Nicotinic Acid for Corneal Ulcers

Although corneal ulcers and their healing have received widespread attention and many and varied therapeutic agents have been used in an at-

tempt to accelerate healing and lessen the density of the scar formed, not much work has been done so far on the role of nicotinic acid in healing these ulcers.

Nicotinic acid is an essential respiratory enzyme and, in its amide form, is an important link in various metabolic processes of the cell. The presence of nicotinic acid is therefore likely to increase cellular metabolism and hence regeneration. The other effect of nicotinic acid is vasodilatation which can assist corneal wound healing by increasing metabolism by diffusion.

The present study was divided into two main groups: (1) experimental and (2) clinical.

The experimental work was undertaken to assess the role of nicotinic acid in the healing of corneal wounds.

Out of the 57 cases of corneal ulcers studied, 20 cases were used as controls. In control cases, only routine treatment of corneal ulcers was given, that is, carbolization, penicillin drops (5,000 u./cc.), atropine ointment (1%), and wet fomentations. In addition to routine treatment, 50 mg. of nicotinic acid daily was administered by the intramuscular route in 20 cases. Initial and final levels of nicotinic acid were estimated in each case. In the remaining 17 cases, 25 mg. of nicotinic acid were given subconjunctivally on alternate days in addition to the routine treatment.

Although there appears to be no deficiency of nicotinic acid in patients with corneal ulcer, because the averages in the authors' study compare with those of Bickness and Prescott, the present authors' investigation appears to indicate that nicotinic-acid therapy assists the healing process both indirectly and directly.

Because nicotinic acid contains coenzymes essential to respiration, it directly aids cellular metabolism. It accelerates corneal wound healing and reduces the healing time of corneal ulcers. It also helps, in some unknown way, to reduce the density of scar formation after corneal ulcers. It may be that epithelial regeneration is accelerated to a greater extent than the laying down of collagenous fibers. By producing vasodilatation and increased diffusion, nicotinic acid increases corneal metabolism which, in turn, stimulates corneal healing. (Am. J. Ophthalmol., May 1954, L. P. Agarwal, M. S. and K. Datt, M. B.; Medical College of Agra, Agra, India)

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Gas Gangrene

This article is presented as a brief review of the available data on gas gangrene, with special emphasis on the treatment of the disease.

The various species of clostridium are by far the most common etiologic agents, but occasionally other forms of bacteria may be responsible.

Clostridium welchii (synonyms, Bacillus aerogenes capsulatus, Bacillus perfringens, and Bacillus welchii) appears microscopically as a short, thick, encapsulated bacillus with truncated ends. It is surprisingly common, being abundantly present in soil, dust, sewage, milk, water, woolen clothing, and fur of domestic animals. It is also common in the gastrointestinal and genitourinary tracts of man and animals.

In spite of the abundance of infective organisms present and a large percentage of traumatic wounds being contaminated with them, the clinical picture of gas gangrene is surprisingly infrequent. In a series of 187,936 such cases reviewed by Altemeier and Furste, only 1.76% developed clinical gas gangrene. The explanation for this is not completely understood. However, it is partly accounted for by a variation of virulence and by the fact that usually there is not enough impairment of the blood supply to provide the proper environment for progressive growth.

As a rule the clinical diagnosis is easily made. The patient is critically ill, prostrated, and apprehensive. There is persistent pain about the wound; devitalized muscle may be bulging through a wound with gangrenous edges; and a thin, foul, watery discharge is usually present. Air crepitation is almost always present and is usually the diagnostic finding that points directly to gas gangrene.

X-rays may be quite helpful by demonstrating the air, particularly so when succeeding films show the gas to be moving along the fascial planes.

Immediately upon confirmation of the diagnosis, antibiotic and antitoxin therapy should be begun while the arrangements for surgery are made. Massive doses of penicillin should be given, preferably by intravenous administration up to 10 million units per day. Aureomycin should also be started at this time by the intravenous method, and this may start at 6 gm. per day and the dosage lowered as warranted by clinical response. Chloromycetin should be given orally (500 mg. every 4 hours) and this drug should also be reduced quickly. Intravenous chloromycetin is now available and should be used until oral chloromycetin is tolerated (1 to 2 gm. may be administered every 6 hours). These antibiotics have been tested against the usual etiologic agents of gas gangrene and are believed to be the most beneficial. Others are either ineffectual or are in the process of investigation.

In reviewing the literature on gas gangrene antitoxin one intriguing fact is constantly encountered, namely, that the theoretic benefits have never been factually substantiated. Nevertheless, its therapeutic potentialities have been repeatedly demonstrated experimentally and it should always be administered immediately if the skin test is negative. If sensitivity to the horse serum is present, the drug should be started in small doses progressing as rapidly as possible.

Surgery should be carried out as quickly as possible, and is still regarded as a most important therapeutic measure. This procedure is frequently carried out in the patient's room, thus confining the possibility of contamination to a small area. Current thinking leans toward a somewhat

more conservative approach, particularly in the matter of amputation where an extensive incision and drainage may now be adequate. Nevertheless, the clinical findings usually dictate the scope of the procedure. Skin incisions should be extensive enough to allow exposure of all the underlying involved tissues, the error usually being that the incision is not inclusive enough or not through the fascial layers. After the diseased tissues are adequately exposed, gauze fluffs saturated with hydrogen peroxide, which has been mixed with zinc peroxide powder into a thin paste, should be carefully packed against all the exposed surfaces. The entire wound should then be covered with a thin layer of xeroform gauze to assist in maintaining a high oxygen level. This dressing should be applied every 6 hours for the first 48 hours and then may be less frequent as improvement progresses. The area should be immobilized without tension and care should be taken with casts.

If casts are being utilized, they should be split when applied; and if pain persists or if any doubt exists regarding the blood supply to the area, the cast should be removed and the wound again inspected. These patients are frequently in shock or preshock stages and blood should be administered as indicated. The usual fluids and electrolytes should be employed, and the patient carefully observed for signs of acidosis. (Am. J. Surg., June 1954, 49 W. 45th St., New York 36, N. Y.; J. W. Taylor, M. D.)

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Anesthesia for Bronchoscopy

The choice of the anesthetic technique to be adopted in anesthetizing a patient for a bronchoscopic examination often presents the anesthetist with a difficult problem. A review of the literature shows that opinions are widely divided upon this subject. This article discusses the factors which require consideration in deciding upon the best method to be used and describes 3 techniques, 1 of local analgesia and 2 of general anesthesia, which the author found to give satisfactory results in anesthetizing more than 120 patients for bronchoscopy.

The essential points governing the selection of anesthetic method for bronchoscopy are: the avoidance of overdose of the drugs used, careful attention to the patency of the airway with suitable provision for removal of foreign material, the prevention of unwanted reflex effects and the prevention of trauma to the patient during the procedure. With these and the surgical considerations in view the author believes that there is no technique of universal applicability for cases of this kind. Instead he suggests that they should be classified into the following groups, each of which calls for a different anesthetic technique.

1. Patients who are reasonably free from bronchial secretions and upon whom the surgeon intends to carry out a comparatively rapid examination.

2. Patients with much bronchial secretion, in whom it is necessary to make a biopsy, when the examination is likely to be prolonged, or when the general condition makes the administration of a general anesthetic inadvisable.

3. Patients who properly belong in the previous group but in whom local analgesia, however well applied, cannot be expected to give satisfactory results.

Patients in the first group are anesthetized by the following general anesthetic technique. Premedication is with papaveretum gr. 1/3 (20 mg.) and scopolamine gr. 1/150 (0.45 mg.) unless they are over 60 years of age, in which case morphia gr. 1/6 (10 mg.) and atropine gr. 1/100 (0.65 mg.) is given. The premedication is given three-quarters of an hour before the proposed time of examination and dosages are reduced if the general condition is poor.

Anesthesia is induced with intravenous thialbarbitone (Kemithal) sodium in a dose which is usually between 0.5 and 1 gm. Suxamethonium chloride is then given to produce relaxation. A dose of 50 mg. has been found satisfactory in the average adult and it is rarely necessary to give more than 65 mg. even to the most resistant patients. The patient is now inflated with oxygen for 5 good breaths, a Macintosh laryngoscope is passed and 1% amethocaine hydrochloride is sprayed onto the larynx and then down the trachea with a suitable spray. The patient is again inflated with oxygen for a few breaths and the surgeon then carries out the bronchoscopy. Oxygen is insufflated down the side tube of the bronchoscope and gentle artificial respiration is performed by rhythmic manual compression of the patient's chest by the anesthetist. Should muscular power begin to return before the examination is complete another small dose of suxamethonium chloride, 10 to 20 mg., is given. This second dose is rarely necessary.

In the majority of cases the action of the relaxant has almost disappeared by the time the bronchoscope is withdrawn and the vocal cords are starting to move. The cough reflex returns immediately afterwards and apart from suitable positioning no further treatment is necessary. If the bronchial tree has remained dry and the action of the relaxant has not quite worn off by the end of the examination the patient is gently inflated with oxygen until spontaneous breathing returns. If, however, secretions have accumulated the surgeon keeps the bronchoscope in position and uses suction as required and the anesthetist continues his artificial respiration by external compression of the patient's chest until the reflexes return. Patients are always returned to the ward in the semiprone position.

Patients in the second group are anesthetized by the following local analgesic technique. Premedication is similar to that in the first group but in addition a dose of quinalbarbitone (Seconal), gr. 1-1/2 to 3 (100-200

mg.) is given 2 hours before operation. It is important to give an oral barbiturate well before scopolamine or atropine, otherwise the action of these latter drugs on the alimentary tract will delay the absorption of the barbiturate from the stomach.

The local analgesic used is 1% amethocaine hydrochloride; 9.75 ml. of this solution are placed in a spray and to this is added 0.25 ml. of 1:1000 aqueous adrenaline hydrochloride. This gives a maximum dose of amethocaine of 97.5 mg. and a final strength of adrenaline of 1:40,000.

The patient is placed in a comfortable sitting position. The mouth is sprayed with the solution, gradually working from the lips backward. Next the spray is directed over the back of the tongue, which is held well forward, while the patient is breathing deeply. This is repeated until the spray falling onto the larynx no longer causes the patient to cough. A swab on a curved applicator, such as Krausze's forceps, is now dipped into the solution being used and then held in one pyriform fossa for 1 minute; the process is then repeated on the other side. Finally the patient's tongue is again held well forward and during a deep inspiration 2 ml. of the analgesic solution remaining are injected rapidly over the back of the tongue with the aid of a syringe and laryngeal canula. If the injection is made at the right moment the amethocaine is inhaled well down the trachea and main bronchi. Coughing is produced and this helps to spread the local analgesic still further. After this preparation the surgeon should wait for at least 5 minutes before bronchoscopy is begun.

Patients in the third group are anesthetized by the following general anesthetic technique. Premedication is similar to that in the first group. Anesthesia is induced by the injection of thialbarbitone (Kemithal) sodium in suitable dosage followed by gallamine triethiodide in a dose varying from 60 to 120 mg. The patient is next inflated with oxygen to allow the relaxant time to become effective. The cords and carina are now sprayed with 1% amethocaine, using a Macintosh laryngoscope and suitable spray. Inflation is again performed for about a minute with oxygen to which a trace of trichlorethylene is added. Spontaneous respiration has often returned at this stage.

The bronchoscopy is now carried out; oxygen and trichlorethylene are blown down the side tube of the bronchoscope and, if the respiratory movements are inadequate, the anesthetist assists the patient's breathing by manual compression of the chest during expiration. Additional small doses of thialbarbitone and gallamine are given if required.

As soon as the examination is finished intravenous atropine and then neostigmine are given as required. The patient is placed in the semiprone position and is not returned to the ward until the anesthetist is satisfied that the respiratory excursions and the cough reflex have fully returned. (Brit. J. Anesth., May 1954, P. D. Kelsall, Manchester Royal Infirmary, Manchester, England)

Emergency Treatment of Bleeding Esophageal Varices

The critical problem presented by the cirrhotic patient during massive hemorrhage from esophageal varices can be attacked actively by either the transthoracic or the peroral route. An entirely satisfactory way to stop variceal hemorrhage has not yet been found, and all must agree that at times it is impossible to control it by any means. Control is urgent, not only because of the blood loss itself but also for prevention of liver failure. If blood is readily available for transfusion, liver failure is more frequently a threat to life than exsanguination. Therefore it is most important that hemorrhage be checked quickly, even though blood replacement can be kept abreast of blood loss.

The goal of emergency treatment of bleeding esophageal varices at Walter Reed Army Hospital is control of bleeding until portal decompression--preferably by portacaval shunt--can be accomplished. It is believed that at present no definite procedure can safely be carried out during active bleeding. Partial esophagogastrectomy, proposed as a maneuver which combines both emergency and definitive treatment, has the objection of increasing portal hypertension and thus encouraging development of gastric varices and erosive gastritis.

One of the advantages realized from the vigorous diagnostic approach to massive upper gastrointestinal hemorrhage is detection of a bleeding lesion which can be treated on the spot. This article reports experiences in the emergency therapy of bleeding esophageal varices by transesophagoscopic sclerosis and tamponade at the time the varices were first detected by esophagoscopy. A group handled in the same way, with the exception that no sclerosing injection was made, are discussed briefly as an imperfect control series. All patients were hospitalized because of massive hematemesis, and, although some had bled previously and some upon initial examination showed the stigmata of cirrhosis, in none had any potentially bleeding lesion ever been found or was the source of the current hemorrhage known.

Eight patients with massive hematemesis were found esophagoscopically to be bleeding from previously undetected esophageal varices and were treated on the spot by intravariceal injection of sodium morrhuate and simultaneous pneumatic tamponade. This emergency therapy was intended to assist control of hemorrhage until surgical portal decompression could be accomplished.

Hemorrhage was satisfactorily controlled through the period of definitive surgery in 3 cases. The patients required an average of 1,170 ml. of whole blood replacement for that lost between the time of injection and operation. The 5 other patients died from 2-1/2 to 21 days after sclerosing injection, before surgery could be done. All deaths were due to liver failure. None died of exsanguination. Altogether there was no significant bleeding following injection in 5 of the 8 patients. At autopsy histologic examination of 4 esophagi failed to reveal evidence of varix obliteration.

A control group of 17 patients, first found to have esophageal varices by esophagoscopy at the time of hemorrhage, were treated by immediate pneumatic tamponade as the only local therapy. Eight were controlled sufficiently well to permit definitive surgery but required an average of 10,090 ml. of transfused blood to replace that lost between institution of tamponade and surgery. Nine patients died as a result of hemorrhage, 3 from exsanguination and 6 from liver failure.

Because of the vicissitudes of varices and of hemorrhage in the cirrhotic patient, it is believed that the two groups are not comparable for deciding the usefulness of adding sclerosis to tamponade for emergency control of bleeding varices. Nevertheless, the present experience has suggested that, however effective tamponade may be made for immediate control, addition of sclerosis injection helps reduce the amount of blood lost during the dangerous period when tamponade is discontinued and definitive surgery is accomplished.

The fate of injected sodium morrhuate is yet to be determined. (Arch. Otolaryng., May 1954, Lt. Col. E. D. Palmer, MC, USA; Walter Reed Army Hospital, Washington, D. C.)

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Management of the Surgically Injured Ureter

The steadily increasing number of radical gynecologic and general surgical procedures performed in the pelvis has resulted in an ever-increasing number of cases of ureteral injury. Because of the close relationship of the lower ureter to the important pelvic structures, most injuries take place in the lower third of the ureter, and, therefore, this report is limited to a discussion of injuries of only that portion of the ureter.

Although in each instance of injury to the ureter the treatment must be individualized, there are several principles which serve as useful guides not only for treatment but also for prevention.

1. Most urologists agree that a more frequent use of preoperative catheterization of the ureters would go far to reduce the number of ureteral injuries, but for an as yet unexplained reason most gynecologists and general surgeons are reluctant to adopt this simple safeguard. Admitting, therefore, that it is either very difficult or impossible to popularize this procedure, the author still suggests that preoperative intravenous urograms at least should be performed on all patients about to undergo major pelvic surgery. Not only does this afford an estimate of the renal function and anatomy on each side, but it also gives warning of any involvement of the ureters in the pelvic disease.

2. Recognition of ureteral injuries at the time of initial surgery is of the greatest importance. Some type of immediate repair can always be

effected and thus prevent the troublesome complications of extravasation, fistula, or renal damage. Furthermore, the patient often recovers without additional hospitalization.

3. Finally, preservation of renal function is naturally of paramount importance, and every effort should be made to solve the problem without resorting to nephrectomy.

Accidental injuries to the ureter, for the purposes of this discussion, may be divided into two groups--those injuries recognized at the time of the operation and those recognized in the postoperative period. The ureter may be ligated, angulated by a suture, included in a suture, crushed, cut (with or without complete severance), or a portion may be resected.

Although generally not recognized at the time of operation, the ligated ureter is the simplest form of ureteral injury to deal with. Most surgeons agree that removal of the suture and retrograde ureteral catheterization with a plastic catheter are all that is required. Periodic follow-up and dilatation in the event of stricture formation would of course be necessary. An angulated ureter and an incised ureter may be treated in a similar fashion except that in the latter it is important that the area of incision be drained extraperitoneally.

Crushing the ureter with a clamp or severing it are more serious accidents. In the case of the crushed ureter it is generally believed that excision of the crushed portion must be carried out or severe stricture formation will result. Thus, crushing injury is no different from complete severance of the ureter. End-to-end anastomosis or implantation of the proximal end into the bladder are the two choices in this situation.

Resection of a portion of the ureter in such a way that neither anastomosis nor bladder implantation is possible is the most serious situation one has to deal with, and one which too often in the past has been handled by purposely ligating the ureter or by nephrectomy. It is the author's opinion that when this accident occurs in the lower third of the ureter a plastic bladder flap can be successfully utilized to bridge the gap and thus save the kidney. This method is fully described.

Ureteral injuries not recognized until the postoperative period tend to be regarded as more definitely in the urologist's realm, and it is in these difficult situations that he is most often consulted. In a general way complications of this type are limited to the effects of ureteral obstruction, or the leakage of urine from the injured ureter causing either extravasation of urine alone, or a ureterovaginal or abdominal fistula, or both.

Unilateral ureteral ligation often goes unnoticed, particularly if there is no pre-existing renal infection and the other kidney is normal. On the other hand, incomplete obstruction of one ureter, caused by a partially tied suture or by angulation, will usually become apparent by the development of renal infection or pain and can be evaluated by intravenous urogram. A preoperative urogram will be very useful for comparison here.

In the author's series there were 11 cases of injury to one or both ureters not recognized at the time of operation. Two of these resulted in incomplete unilateral ureteral obstruction. One was treated by ureterolysis, and the second, in whom the injury occurred in the intramural portion, required a plastic meatotomy through the open bladder. Both of these patients recovered, have normal pyelograms, and are well to date.

Bilateral ureteral ligation causes complete anuria and can easily be recognized if the urinary output is observed. One cannot emphasize too strongly that anuria following major pelvic surgery demands early cystoscopic investigation to rule out bilateral ureteral obstruction. Two cases of bilateral ureteral ligation occurred following panhysterectomy. The first was treated by an attempted deligation on the day after operation, but the anuria persisted and at reoperation a bilateral ureterovesical implantation was successfully carried out. This case illustrates the difficulties of emergency ureteral deligation and suggests that nephrostomy followed at a later time by a plastic procedure to the ureter is the method of choice. This plan was successfully carried out in the second case of bilateral ureteral ligation.

The remaining 7 cases of ureteral injury all were instances of urinary extravasation in the form of a pelvic abscess, usually associated with a ureterovaginal or abdominal fistula.

Two of these patients were treated by nephrectomy, largely because the severity of the local infection contraindicated any attempts at repair. Two other patients with a persistent ureterovaginal fistula were treated by ureterovesical implantation with good results in each. In the last 3 cases there were 2 ureteroabdominal fistulas and 1 ureterovaginal fistula; in each case the injury occurred just high enough so that ordinary ureterovesical implantation was not possible. In each of these cases it was possible to perform a ureterovesical anastomosis by constructing a bladder flap and utilizing this to bridge the gap.

Ureteral injuries, if they occur, are best corrected at the time of the original injury; and the site of ureteral incision, repair, anastomosis, or implantation should always be drained extraperitoneally.

Ureteral injuries in the lower third of the ureter can usually be corrected without resorting to ureterosigmoidostomy, ureterocutaneous anastomosis, or nephrectomy. If the remaining ureter is of sufficient length, a ureterovesical implantation can easily be done, and a successful postoperative result may be expected.

If there is insufficient length to carry out a ureterovesical implantation, a plastic ureterovesical anastomosis using a bladder flap can be carried out either at the time of the injury or at a subsequent operation. (Surg., Gynec. & Obst., June 1954, E. K. Landsteiner, M. D.; Rhode Island Hospital, Providence, R. I.)

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Adenocarcinoma of the Parotid Gland

This article records the clinicopathologic features of 27 examples of heretofore rarely encountered or described acinic cell adenocarcinomas of the parotid gland. Twenty-two of these were found among about 900 major salivary gland tumors treated at Memorial Hospital since 1930. Five additional cases submitted from other institutions are included because of their unusual nature.

The term adenoma has been employed to designate many tumors of the salivary glands. At present it is used only for the oxyphilic granular cell tumor and papillary cystadenoma lymphomatosum. A brief review of the literature on adenomas is given; little mention is made of the oxyphilic granular cell adenoma which has been amply reviewed by Stump, Meza-Chàvez, and others, or of the papillary cystadenoma lymphomatosum recently reviewed by Thompson and Bryant.

Grossly, the acinic tumor may resemble superficially a mixed tumor, but close inspection will reveal a difference. The acinic tumor does not present the moist myxomatous appearance of the mixed tumor. It is encapsulated, round or oval, and the cut surface is lobulated, friable, and generally homogeneously glistening grayish white. Occasionally there may be necrotic foci and cysts. The recurrent lesions may show multiple foci which are similar to those of mixed tumors.

It is the authors' belief that these tumors arise from the acinic cells because of histologic resemblance, absence of other recognizable tumor types in multiple sections, foci of apparent serous secretions, and the similarity of the results of periodic acid-Schiff's staining in normal and in cancerous cells.

Clinical observations upon the 27 cases are summarized. Clinically, the lesion closely simulates a mixed tumor. All of these tumors thus far recognized have arisen in the parotid glands; however, occurrence in other salivary glands can be expected.

The time elapsing between discovery of the tumor by the patient and definitive medical care varied from a few weeks to 16 years. Seventeen of the 27 patients were women. The age range at the date of onset of symptoms was from 17 to 68 years. Recurrence was encountered in about 50% of the patients. Many of these patients had had several recurrent lesions at various intervals over long periods.

Five of the patients died. One died without apparent residual neoplasm, 3 died of the neoplasm, and 1 died of pulmonary embolism 2 months following operation. Three patients are living with the neoplasm and for 3 the status is indeterminate. Metastasis occurred in 2 of those dying of the disease. Pulmonary metastases have been found in 2 of the 3 patients living with the neoplasm. The facial nerve was not impaired prior to initial treatment but has been impaired in patients suffering recurrence.

Treatment was largely surgical. It appears that an excision of the tumor with a margin of parotid gland (subtotal parotidectomy), performed with care not to rupture the capsule, constitutes the best method of treatment. Because of the infrequency of lymph node involvement in the material studied thus far, neck dissection does not appear to be indicated. (Am. J. Path., May-June 1954, J. T. Godwin, M. D., F. W. Foote, Jr., M. D., and E. L. Frazell, M. D.; Memorial Center for Cancer and Allied Diseases, New York, N. Y.)

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Free Skin Grafting in Oropharyngeal Areas

Free skin grafting in the sinus, oral, and pharyngeal cavities of the head-and-neck system has not only proved invaluable as a dressing for raw wounds, but also has enhanced techniques to further the immediate repair and reconstruction of the operated areas. The advances in excisional surgery in the head and neck have caused greater interference with functions and esthetics in these areas, thereby demanding a greater effort and understanding in the rehabilitation of these patients. The extension of radical cancer surgical principles in particular has created wounds that, in many instances, require skin-grafting techniques. It has been found desirable, in most instances, to apply the skin graft at the time of the primary operation, thus mitigating scar-contracture deformity with its severe effects on function and form. The application of the general principle of skin grafting has extended itself to include dressings in radical operations about the maxilla, cheek, orbit, dura, alveolus, buccoalveolar sulcus, glossoalveolar sulcus, floor of the mouth, tongue, palate, pharynx, larynx, and cervical esophagus.

Free skin grafting in the cavities contained in the head-and-neck system has gradually broadened to include wounds of every area and organ that are so large that primary approximation is impossible and healing by secondary intention with scar contracture would seriously impair form and function. The areas included have consisted of: (1) cavities--dura, maxilla, ethmoid, sphenoid, and frontal sinuses, cheek, orbit; (2) oral cavity--cheek, alveolus, buccoalveolar sulcus, glossoalveolar sulcus, floor of the mouth, tongue, palate; (3) pharynx--subtotal pharyngectomy, total pharyngectomy; (4) larynx--partial laryngectomy; and (5) cervical esophagus.

The contraindications to skin-grafting wounds in the head-and-neck area following radical surgical extirpation are the same as those that apply, in general, throughout the body. When the wound can be repaired by the use of local tissues in the area without serious impairment to function, that technique should be given priority over any grafting procedure. Grafting is not recommended when the wound is infected. All of the fresh wounds in the

intraoral cavity and its associated areas are potentially infected from the organisms that naturally inhabit the mouth. However, with techniques that secure and immobilize the graft plus the great advantage of adequate biotherapy, skin grafting may be carried out successfully in almost every instance.

Ordinarily, areas that have received intensive irradiation and are devitalized as a result of the fibrosis and endarteritis associated with this type of therapy are not considered satisfactory tissue beds for the implantation of a graft. This is particularly true if this heavily irradiated area is also a potentially infected area as a result of oral or pharyngeal secretions. Direct approximation of the wound with the hope of healing per primum, even at the sacrifice of considerable function, is often as much as can be expected at the first operation. Delayed pedicle flaps with an independent blood supply are often necessary to repair these areas. On the other hand, it has been noted that, when grafts are implanted into these areas and there is a "take" of that graft, there is considerably less fibrous-tissue and scar-tissue reaction about the graft and much less contraction of the graft itself.

Loss of the graft is the most serious complication. Fortunately, it is infrequent. This complication is certainly mitigated when one enforces the contraindications to grafting. Loss by infection is usually caused by the Pseudomonas aeruginosa bacillus. Loss by starvation of the graft (poor tissue bed) is usually the result of implantation upon bone, heavily irradiated tissue, or scar tissue.

Graft contracture varies with the natural local tissue reaction, the presence of a low-grade inflammatory reaction, and the reaction of the skin to the tissue bed. Graft contracture may defeat the purpose of the original procedure by causing subsequent deformities, stenosis, and interference with function. This latter complication can be mitigated by massage and stretching of the grafted areas in the accessible areas of the oral cavity and by the prevention of scar contraction by the use of an inert stent in the areas that are not accessible, such as the pharynx, larynx, and esophagus. It may be necessary, in addition, to dilate these areas by bouginage if contracture occurs following the removal of the stent.

The rationale and technique of free skin grafting to the sinus cavities, the internal aspect of the cheek, alveolus, bucco- and glosso-alveolar sulci, the tongue and floor of the mouth, the palate, pharynx, larynx, and cervical esophagus are presented. With the advance in the radical excisional type of surgery performed in the head and neck the needs for free skin grafting, not only as a dressing for the wound but also for the improvement of the functional and esthetic potential of the head and neck, have been greatly broadened. The propriety of immediate skin grafting under these various circumstances in the hope of performing the maximum amount of rehabilitative surgery for the patient in a single one-stage composite operation is evident. The clinical results of this conception of the management of these head-and-

neck problems have proved worth while. Attention is directed to the value of delayed skin grafting in certain special instances in surgery about the tongue and floor of the mouth. (Cancer, May 1954, J. J. Conley, M. D.; St. Vincent's Hospital, New York, N. Y.)

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From the Note Book

1. Rear Admiral Lamont Pugh (MC) USN, Surgeon General of the Navy, left Washington on 22 June 1954 to visit naval medical facilities at Port Hueneme, Point Mugu, and San Francisco, Calif. While in the San Francisco area, Admiral Pugh attended the 103rd Annual Meeting of the American Medical Association and represented the Navy at the sessions of the Section on Military Medicine. (TIO, BuMed)

2. Rear Admiral B. W. Hogan (MC) USN, Deputy Surgeon General and Assistant Chief of the Bureau of Medicine and Surgery, was, on 7 June 1954, honored when the Trustees and the Faculty of Villanova University conferred on him the University's highest academic honor, --the degree of Doctorate of Laws (Honoris Causa), --in public recognition of his many years of devoted service to the United States Navy and to his church. (TIO, BuMed)

3. Captain O. A. Smith (MC) USN, Commanding Officer of the Naval Dispensary, Navy Department, Washington, D. C., was honored by Evansville College, Evansville, Indiana, on 5 June 1954. He was invited by the Faculty and Trustees of Evansville College to be present at the Special Centennial Convocation to be held at Moores Hill, Ind., as a part of the Centennial Commencement Program, and to accept the honorary degree of Doctor of Science. (TIO, BuMed)

4. Captain L. D. Carson (MC) USN, District Medical Officer, First Naval District, represented the Surgeon General and the Medical Department of the Navy at the dedication of the St. Lawrence Memorial Hospital at St. Lawrence, Newfoundland, on 6 June 1954. Public Law 389 of October 25, 1949 authorized the Secretary of the Navy to construct, and the President of the United States to present, this hospital to the people of St. Lawrence, Newfoundland, in recognition of the heroic efforts of the townspeople residing in St. Lawrence and Lawn at the time of the wreck of the U. S. S. Pollux and the U. S. S. Truxton in February 1942. (TIO, BuMed)

5. Naval Dental Corps officers of the San Diego area conducted a program for the San Diego County Dental Society in the San Diego Club on 21 June 1954. Fifteen table clinics were presented. (TIO, BuMed)

6. The Bureau of Medicine and Surgery exhibit, "The U. S. Navy Dental Corps' Casualty Treatment Training Program", was shown at the Minnesota State Medical Association meeting in Duluth, Minn., 7-9 June 1954. At the 103rd Annual Meeting of the American Medical Association in San Francisco, Calif., 21-25 June 1954, two other Bureau of Medicine and Surgery exhibits were displayed. The first, "Unusual Tumors of the Brain", presented 20 cases of rare brain tumors by means of x-rays, color photomicrographs, and color photographs; the second, "Naval Medical Service with the First Marine Division in Korea", depicted the activities of the naval medical components of the First Marine Division under combat conditions. (TIO, BuMed)

7. Under the sponsorship of the Veterans Administration, the National Bureau of Standards has developed an electronic instrument which automatically detects changes in the physiological condition of a patient under anesthesia throughout the course of an operation. Known as the NBS Physiological Monitor, this instrument measures changes in the patient's blood pressure, heart beat, and respiration as they occur and presents the data on a panel for interpretation by the surgeon or anesthesiologist. A permanent record of the patient's condition during the operation is also provided by a recording device incorporated in the assembly. (NBS Summary Technical Report 1872)

8. Two years ago the Parker Pen Company eliminated time clocks from its plant. There was no guarantee that this plan would work, but 2 years of operation has proved the new system a success. The elimination of time clocks has not only been practicable but also has produced considerable time savings. The first year, tardiness dropped 47%--the second year, 33%. At present there are approximately 51 cases of tardiness a month--an all-time low for the company. (Everybody's Business, ICS, May 1954)

9. Of 459 industrial firms surveyed by Mill and Factory, 49% maintain employee cafeterias. These cafeterias accommodate 200 or more employees and 56% of them are operated by outside agencies. The companies report that most of their workers take advantage of cafeteria facilities. Of these companies 98% find that "in-plant eating" has definitely been an asset as far as employee morale is concerned. (Everybody's Business, ICS, May 1954)

10. Ninety-six cases of chronic suppurative otitis media treated through the eustachian tube with the aid of the catheterizing eustachioscope are reported in the Archives of Otolaryngology for May 1954 by L. K. Pitman, M. D.

Changes in Shipboard Medical Department Deployment During Battle

The medical department of a ship during battle has, in the past, been handicapped by a lack of information concerning material and personnel damage.

A procedure has been instigated aboard the U. S. S. PHILIPPINE SEA (CVA-47) which was tried aboard the U. S. S. MIDWAY (CVB-41) in 1948 with marked success.

Through centralized direction of personnel casualty handling, the new procedure makes possible the maximum utilization of medical facilities during battle.

The Medical Service Corps officer has his general quarters station in Damage Control Central and is responsible for the keeping of records concerning personnel injuries, where they are located, and the condition of battle dressing stations in the area.

During battle conditions the above statistics are assimilated and when conditions permit, the MSC officer directs the removal of casualties in such a way as to prevent overcrowding of a battle dressing station or attempted use of stations which have been damaged during the battle.

All casualties are reported to Damage Control Central and accurate records can be maintained and checked against the patient log at each battle dressing station. This assures the treatment of all casualties and eliminates partially the "loss" of patients.

The above procedure has a two-fold advantage over the old method of caring for battle casualties. First, it is an organized effort utilizing the existing channels of information and requires no additions or changes in ship procedure to improve the handling of battle casualties. Second, it forceably brings to the attention of the crew, the necessity of learning first aid.

Many have experienced the confusion of multiple conflicting calls during general quarters and the frustrated feeling of being locked up below decks and unable to do anything about the situation.

With the instigation of the new medical department central control of casualties and the dissemination of that information to the crew, order has appeared and a well-controlled method of handling casualties has been established. (MO, U. S. S. PHILIPPINE SEA (CVA-47))

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Training Courses for Naval Reserve Medical Personnel Fiscal Year 1955

The Chief of Naval Personnel has promulgated information concerning active duty for training for members of the medical component of the Naval Reserve for Fiscal Year 1955.

Special courses of instruction designed to aid in keeping Reserve medical personnel on inactive duty abreast of recent advancements in military and naval medicine have been established as listed below.

Quotas providing for pay and authorized allowances for personnel in a non-drill pay status have been assigned each naval district. Reserve medical personnel, including those attached to pay units of the Naval Reserve, are encouraged to take advantage of the opportunity to attent one of these courses in a pay status. Detailed information may be obtained from the Commandants.

Seminar for Commanding Officers, Naval Reserve Medical Companies (6 days)--Will convene in the Bureau of Medicine and Surgery, Navy Department, Washington 25, D. C. on 4 Oct 1954. All naval districts have been assigned a quota for this Seminar.

Special Weapons, Isotopes, and Military Medicine (5 days)--U. S. Naval Station, Treasure Island, San Francisco, Calif.; 28 Feb 1955.

Field Medicine (14 days)--Camp Pendleton, Calif. Classes scheduled to convene on 17 Aug and 12 Oct 1954, 15 Mar and 17 May 1955, respectively. Assigned quotas limited to 11th, 12th, and 13th naval districts.

Ensign Probationary (Medical) Training (14 days)--All U. S. Naval Hospitals. Quotas assigned each naval district for first quarter.

Medical Military Training, U. S. Naval Medical School, National Naval Medical Center, Bethesda, Md. (14 days)--Courses will convene on 11 Oct 1954 and 7 Mar 1955. The first week of this course is devoted primarily to the medical aspects of Special Weapons and Radioactive Isotopes, with emphasis on basic concepts of Atomic Medicine. The second week is a Medico-Military Symposium aimed at informing Reserve medical personnel concerning the Reserve Program and the activities of the Medical Department in general, presenting recent advances in military medicine,

including Aviation, Submarine, and Field Medicine. Panel discussions of Army, Navy, and Air Force Reserve Medical Programs will be included.

Insect and Rodent Control (14 days)--Preventive Medicine Unit No. 1, Naval Air Station, Jacksonville, Fla. Third Wednesday of each month. Naval districts assigned quarterly quotas for Fiscal Year 1955.

Malariology and Insect Control (14 days)--Naval Air Station, Alameda, Calif. First and third Wednesday of each month. Commandants 11th, 12th, and 13th naval districts assigned quotas for this course. (ResDiv, BuMed)

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Correspondence Course

Medical Department correspondence course "Submarine Medicine Practice" NavPers 10707; availability of Objective Type Questions for.

Objective type questions for the Medical Department correspondence course entitled "Submarine Medicine Practice" (NavPers 10707) are now available for distribution.

This course evaluation remains at thirty-two (32) Naval Reserve promotion and retirement points at the rate of 4 points per assignment.

The text material for this course has not been changed. Officers who completed the earlier thesis type course for credit will receive no further credit for completion of this course. (NMS, NNMC, Bethesda, Md.)

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BUMED INSTRUCTION 6700.7 20 May 1954

From: Chief, Bureau of Medicine and Surgery
To: Ships and Stations Having Medical/Dental Personnel Regularly Assigned

Subj: Substitute Item List; explanations concerning

Ref: (a) OPNAVINST 4440.1 dtd 11 Aug 1953

Encl: (1) Substitute Item List

This instruction reiterates the Bureau's policy regarding newly standardized items and substitutions and explains the purpose of the Substitute Item List.

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BUMED INSTRUCTION 1510.5 21 May 1954

From: Chief, Bureau of Medicine and Surgery
To: All Ships and Stations Having Dental Personnel Regularly Assigned

Subj: Dental technicians; in-service training of

Ref: (a) Article 9-18 ManMedDept

Encl: (1) Guide for In-service Dental Technician Training Program Schedules

This instruction provides instructions and guidance for the continuous in-service training of dental enlisted personnel required by reference (a).

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BUMED NOTICE 6820 25 May 1954

From: Chief, Bureau of Medicine and Surgery
To: All Activities Under the Management Control of BuMed, and Naval School of Aviation Medicine

Subj: Periodicals; subscription to

This notice revises the procedure for procurement by addressees of subscriptions to professional medical, dental, and technical periodicals. BuMed Instruction 6820.6 of 16 Apr 1953 is cancelled for addressees only.

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BUMED INSTRUCTION 4500.1A 27 May 1954

From: Chief, Bureau of Medicine and Surgery
To: Distribution List

Subj: Medical and dental materials under cognizance of BuMed; protection during major overhaul or conversion of ships

This instruction provides for the protection of medical and dental materials under the cognizance of the Bureau of Medicine and Surgery during a period in which a vessel is undergoing extensive overhaul or conversion. BuMed Instruction 4500.1 dated 3 Mar 1953 is cancelled.

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BUMED NOTICE 5400 27 May 1954

From: Chief, Bureau of Medicine and Surgery
To: Commanding Officers, U.S. Naval Hospitals

Subj: Hospital organization charts and functional statements

Ref: (a) BuMed Inst. 5400.2A
(b) NavMed P-1335, Organization Guide for Naval Hospitals
(c) Chap. 11, ManMedDept

Encl: (1) Some Errors Noted in Annual Submission of Hospital Organization Charts and Functional Statements

This notice comments on organization charts and functional statements submitted by the naval hospitals in accordance with reference (a).

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BUMED INSTRUCTION 6320.8A 1 Jun 1954

From: Chief, Bureau of Medicine and Surgery
To: All Hospitals, Continental U.S. Stations Having Infirmaries, and All Extracontinental Stations Having Medical Corps Personnel Regularly Assigned

Subj: Beds and Patients Report (DD Form 443); reporting requirements for

Ref: (a) BuMed Inst. 6310.3
(b) BuMed Inst. 7330.1
(c) Art. 1-21(4), ManMedDept

This instruction sets forth the requirements for reporting beds and patient data on DD Form 443 as needed by this Bureau, the Bureau of the Budget, and the Department of Defense. BuMed Inst. 6320.8 of 25 Feb 1954 is cancelled.

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BUMED INSTRUCTION 6530.2B 1 Jun 1954

From: Chief, Bureau of Medicine and Surgery
To: All Ships and Stations Including MSTS

Subj: Blood derivatives; potency data and disposition instructions

This instruction provides information as to the potency periods of blood derivatives, authority for their disposition, and assigns the responsibility for replacement of outdated material to the holding activity. BuMed Inst. 6530.2A is cancelled.

BUMED INSTRUCTION 4860.1 4 Jun 1954

From: Chief, Bureau of Medicine and Surgery
To: Commanding Officers, National Naval Medical Center and All Continental Hospitals

Subj: Commercial and industrial-type facilities; Department of Defense program for review of

Encl: (1) SecNavInst 4860.5
(2) NavCompInst 4860.1

This instruction informs addressees of subject program.

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The printing of this publication has been approved by the Director of the Bureau of the Budget, June 23, 1952.

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AVIATION MEDICINE DIVISION

A Study of "G" Suit Inflation

This project was conceived at the Navy Jet Transition Squadron as part of the never-ending search for causes of unexplained accidents. An investigation of possible unforeseen hazards within the anti-blackout mechanism was launched. A review of accidents occurring in 1953 and early 1954 showed 5 fatal cases in which speculation had a large part to play in deciding the cause. These accidents had a common component: the pilots appeared to be unconscious or incapacitated from the onset of difficulty until crash. This time lag is remarkably short in jet aircraft, being sometimes less than 2 minutes of uncontrolled flight from 15,000 to 20,000 feet to earth. Very little time was available for relief of the unknown difficulty and subsequent recovery from unusual flight attitude or for ejection.

What could these causes be? Hypoxia is considered first in almost all cases and is surely a common cause. Asphyxia due to noxious gases such as carbon monoxide is possible. Hyperventilation in inexperienced students is a frequently seen phenomenon and has often caused unconsciousness in the pressure chamber. Medical accidents such as cerebral hemorrhages, heart attacks, et cetera, are always possible but remote in young, healthy flyers. Destruction of the body in crashes makes autopsy findings usually worthless in this decision. Mechanical failures of the aircraft are to be considered, but often don't seem to apply because of the lack of effort by the pilot to combat the unusual attitude and the absence of radio transmissions announcing his difficulty. Time, again, doesn't allow much talk. This study was launched in an effort to rule either in or out the anti-blackout mechanism as a new factor to consider.

In development of the G valve and suit, some phases of this problem had to be considered. However, no relevant information or directives have been found, and to our knowledge no studies have been made of the possibilities herein cited. It is hoped that all concerned activities will consider this problem further and pass on any information they have available. Future studies will be conducted in the air and are suggested for the human centrifuge.

The G valve itself is remarkably sturdy and appears so constructed that failure would be near impossible. Of course, this conclusion is never justifiable where mechanisms are concerned, for time and again, we find in practice that the best constructed gadget may fail. Pilots in this squadron report that they have experienced "stuck" G valves, and one reported receiving such severe inflation from the suit that nausea resulted and the gunnery run had to be discontinued. Several pilots who have flown F9F's report experiencing "stuck" valves in that aircraft also and occasional inflation during one G flight. All cases reported to date were easily relieved by disconnecting the tube or hitting the valve. The valve delivers 1 lb. per sq. in. of air pressure per G above 1.75 G on the low setting. On the high setting, it delivers 1.4 PSI per G. Thus, at 7 G, near the tactical limit for this aircraft, 6.2 PSI and 8.1 PSI would be experienced by the pilot on low and high settings respectively. When tested on the ground by opening the valve manually, the following average pressures were found in 10 TV-2 aircraft:

35% RPM	2 PSI
60% RPM	9 PSI
70% RPM	10 PSI
80% RPM	10 PSI
100% RPM	12 PSI

The highest pressure found on an aircraft at 100% RPM was 14 PSI. The high or low setting of the valve does not change the pressures received under manual operation. It is seen from these figures that about twice the usually needed pressure is available from the valve. Such de-

sign is understandable since RPM may be low while a plane is pulling G and the pilot still receive protection. The outlet pressure relief valve worked at an average of 10 PSI. By over-riding the pressure relief valve, about 18 PSI could be obtained in the front seats and about 24 PSI in the rear seats at 90% RPM.

A study was made of the effects of this pressure applied to the G suit of the aviator, simulating a failure of the G valve mechanism. No attempt was made to reproduce actual G forces; only the effects of inflating the G suit were studied. The subjects were all students in Jet Transition who had just completed the Navy single engine training syllabus and had approximately 90 flying hours experience with G suits. Their average age was 23 years and their physical condition good. They were strapped into the cockpits of the TV-2 as though ready for flight, including oxygen masks and wearing Z-2 cover-all G suits. They were asked to relax as much as possible, the aircraft brakes being held by the second seat occupant during turn up. Nineteen tests were done on 12 subjects (including the author). The pressure and resulting suit inflation was applied by surprise for 30-60 seconds. For brevity here, individual tests will not be outlined but the findings summarized.

There was no loss of consciousness or visual diminution perceived by any subject. The major difficulty was limitation of respirations and difficulty in talking. Breathing could be accomplished, however, by using short inhalations with great effort. The incapacity encountered varied with the stature of each subject. The smaller or shorter ones experienced more limitation of motion of their legs and torso and discomfort developing into pain because the suit bladder lay higher over the epigastrium and pressed against the costal margin. Inflation was not like a sudden blow to the abdomen, rather it rose steadily to a peak until its existence became entirely thought consuming. A few of the subjects felt that they would have been unable to act under the 10 PSI pressure, particularly after 15 seconds of application. Most others felt and demonstrated full control of their arms and ability to perform important cockpit functions. It was hard to gauge actual ability to unplug the G hose and relieve the pressure. However, definite difficulties were encountered because of the suit hose's posterior location behind numerous straps, the torso fixation, and the rigid inflation of the tube itself. Also, after disconnection, more time was consumed finding the hose end and releasing pressure through the spring-loaded stopper present in most suits. A full urinary bladder made the pressure understandably more excruciating. Most subjects could not position their legs for ejection but could reach the arm rests of the Air Force type ejection seat and raise their arms as if reaching for the face curtain of the Navy type seat. Switching to 100% oxygen and pressure (41M) did not aid respiration. One G suit ripped in a leg where it had been stitched for fit, but all others tested held firm, even under 26 PSI. This failure of the suit did not relieve abdominal pressure. Four of the subjects' suits were inflated to 26 PSI by blocking the pressure relief valve. All found the

condition almost totally incapacitating and the test had to be discontinued in 2 subjects at 6 and 15 seconds because of extreme discomfort. These 2 were 5'10" and weighed 145 and 165 lbs. They were, as before mentioned, also more severely affected by the 10 PSI tests. The consensus statement of all subjects was, "When the pressure first hit, I might have lost some control of the aircraft, but this would be quickly regained. After a few seconds, I noticed great difficulty in breathing and performing cockpit movements, particularly with my legs. Then the discomfort became more intense and the pressure thought-consuming to the point where I think anything else inside or out of the aircraft would have been forgotten." One pilot stated that he was so distracted and uncomfortable, he actually forgot he had arms he could use. They all confessed that surprise inflation of this magnitude during flight would be seriously detrimental to their performance.

Objectively, the subjects became flushed in the face and neck and their neck veins engorged. Pulse was noted to slow an average of 12 beats per minute and the systolic blood pressure rose 20 mm. of mercury during inflation and remained elevated for about a minute thereafter. The subjects' limitation of motion and extreme discomfort was clearly observable. There were no after-effects of the tests except moderately sore calf and abdominal muscles and a few petechial hemorrhages of the thighs.

This preliminary and admittedly incomplete study has shown that G suit inflation to the pressures available would present the pilot with great difficulties. Reports of such failures are few but certainly exist and some unexplained accidents offer a fertile field for speculation. It is easy to see that if this inflation occurred while a pilot was performing a near critical flight maneuver such as formation, aerobatics, or gunnery runs near Mach limits, he might easily find himself thrown quickly into uncontrollable flight. Persons with a more sensitive carotid sinus reflex than that of our test subjects could be rendered unconscious. If, while pulling G, a pilot experienced increased inflation of his suit, his natural reaction to push over in an effort to relieve the G force might aggravate matters. If explosive decompression occurred while the suit was inflated through normal G forces, the rapid expansion of the suit air as well as that in the pilot's lungs and abdomen, might prove disastrous if not quickly relieved.

By no means should this knowledge cause pilots to lose faith in the G suit or valve. It is an excellent piece of equipment to combat blackout and fatigue and may also serve as accessary flotation gear. It is certainly essential to high-speed fighter tactics. Perhaps the awareness of its rare hazards is enough safeguard. For indoctrination, a pilot can easily experience the condition by operating the G valve manually for 5 seconds during 100% turn up. Ground maintenance of the G valve to assure pressure relief at 8-10 PSI and proper function of the mechanism is a worthwhile safety precaution. The spring-loaded stopper of the G suit hose is very handy, but in this case, causes loss of valuable seconds in relieving

pressure. It also causes moderate disorientation when the hose becomes disconnected during G maneuvers, keeping the suit inflated. Most pilots quickly learn to gauge the amount of G they are pulling by the pressure they feel from the suit, and the maintained inflation in one G flight is misleading to them. The location of another pressure relief valve in the suit itself might be considered. The aviator's knife, if readily available, would give excellent relief. Most aviators seem to wear their knives on the calf which is obviously inaccessible, especially in the inflated case. Its relocation on the anterior thigh or chest would appear more appropriate. Its sharpened point would supply satisfactory, quick pressure relief through the abdominal suit bladder. Inability to position the legs for ejection would be disconcerting, but is not essential for an emergency ejection.

Actually, the aviator doesn't mind riding a keg of dynamite, and does it every day in the forms of bombs, gasoline, and ejection seats. All we want to know is how to cut the fuse in case it starts to blow. (LT F. H. Austin, Jr. (MC) USN)

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Safeguarding Aviation Selection Tests Materials

All ships and stations authorized to administer Naval Aviation Selection Tests are again reminded of the necessity for safeguarding test booklets and other materials previously classified RESTRICTED--SECURITY INFORMATION. Such materials continue to require protection for reasons other than the interest of national security. It is essential that the tests not be shown to unauthorized persons in or out of the Navy, and not reproduced in whole or in part.

Destruction of current test material when required or necessary will be by burning or shredding under the supervision of personnel authorized to handle test material in the presence of a witness and both will sign a certificate indicating date of destruction, title of material, serial number, and number of copies destroyed.

In the event of compromise or loss of test material, a written report will be made immediately to the Chief of the Bureau of Medicine and Surgery (Code 537) indicating all pertinent facts and the specific action taken.

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Change of Address

Please forward requests for change of address for the News Letter to: Commanding Officer, U. S. Naval Medical School, National Naval Medical Center, Bethesda 14, Md., giving full name, rank, corps, and old and new addresses.

Defects Noted on SF-88's Submitted to BuMed: April and May 1954

Excess copies	23
Lack of copies	24
Carbon copies not legible	5
Carelessness in recording results	6
No designator after rank	28
Flight time omitted	28
Not fully explaining dental defects of NavCad applicants	2
Not recording C. E. R. and improperly placing pulse in space	10
Refractions not properly recorded	22
Not leaving right side of item 73 for BuMed endorsement	4
Failure to state aviator's service group in recommendations	20
Not clarifying or going into enough detail regarding medical defects	2
Failure to mention disqualifying defects on SF-89	7
Failure to submit SF-89	2
Failure to state NAO application	1
Omissions or mistakes made in the following:	
Item 12 (Date of Birth)	1
Item 44 (Dental)	3
Item 45 (Urinalysis)	3
Item 46 (Chest X-ray)	14
Item 47 (Serology)	2
Item 57 (Blood Pressure)	4
Item 62 (Heterophoria)	25
Item 63 (Accommodation)	16
Item 65 (Depth Perception)	5
Item 66 (Field of Vision)	5
Item 69 (Intraocular Tension)	4
Item 70 (Hearing)	1
Item 71 (Audiometer)	16
Item 77 (Qualification of Examinee)	1
Item 81 (Name of Dentist or Physician)	1

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The Naval Flight Surgeon's Responsibility in Aircraft Accidents

Revised OpNav Instruction 3750.6A entitled "Navy Aircraft Accident, Incident, and Forced Landing Reporting Procedure", has recently been distributed to field activities. This instruction sets forth investigation procedures including the submission of the Medical Officer's Report of Aircraft Accident/Incidents and Ground Accidents, OpNav Form 3750-8 (Rev. 2-54), and participation of the flight surgeon as a member of the Aircraft Investigating Board.

The primary duty of every flight surgeon in a flight status is aviation medicine. At this time Naval Aviation is faced with an unacceptable rate of accidents and fatalities, particularly in high-performance jet aircraft. It is appropriate, therefore, that flight surgeons review their responsibilities as outlined in the Manual of the Medical Department, Chapter 14, Section II, Aviation Medicine.

Approximately 65% of all aircraft accidents are due to human error (pilot error and error of other personnel). Investigation of the physiological and/or psychological factors in the human error accidents is a real challenge to flight surgeons, who are the only widely distributed trained personnel available to monitor the machine-operator combination involved. It is appreciated that such investigations are difficult, to say the least, and that a minimum of instructional material on investigating the aeromedical aspects of aircraft accidents is available to field activities. In this connection, it is anticipated that during the current year an aeromedical section will be prepared as an addendum to the "Handbook for Aircraft Accident Investigation" recently published by the U. S. Naval Aviation Safety Activity.

In order to readily carry out an effective investigation of the aeromedical aspects of aircraft accidents the flight surgeon must be intimately acquainted with the many problems of operational flight. The Manual of the Medical Department, paragraph 14-6, Study of Flight Conditions and Personnel, reads "The flight surgeon, in order to carry out his primary duties in connection with the care and welfare of flying personnel in the command, shall associate himself with the immediate environment of the pilot as closely as possible. He must come to know intimately each pilot and aircrewman, his personality and different moods, in order that he may readily note any psychological changes or tensions and take steps to ameliorate them whenever possible. The flight surgeon shall take advantage of opportunities afforded him to accompany pilots on flights in order to become familiar with the conditions under which flying personnel perform their various duties, and to gain further knowledge on the physical and psychological stress of flying." Without intimate knowledge of both the man and the machine he operates, evaluation of the problems involved in operating aircraft is impossible.

A revised Medical Officer's Report has recently been printed and is included as the third enclosure to OpNav Instruction 3750.6A. The form has been redesignated OpNav Form 3750-8 and has been distributed to the field. Page 2 of this form must be completed for each person involved in any accident requiring submission of the Medical Officer's Report. Since the usage of page 2 will be considerably greater than the other pages of the form, it is being printed separately in pads of 100 under the number OpNav Form 3750-8A. The Medical Officer's Report forms should be requisitioned from the nearest major supply point for aeronautical publications immediately and upon receipt of the new forms, the old forms should be destroyed.

The Medical Officer's Report form is, in general, self-explanatory; however, detailed comments are desired on any items pertinent to prevention, investigation, use of personnel equipment, escape, survival, cause of injury, et cetera, in an accident. Numerous items have been added to the revised form, some of which merely require a check mark or type number, in an effort to direct the flight surgeon's attention to the many factors involved. It is anticipated that the aeromedical section which will be added to the Handbook of Aircraft Accident Investigation will show in detail how to go about investigating and reporting on the items listed on the Medical Officer's Report form.

It is important to note that under the new reporting instructions the injury classification has been changed. The previous classification of serious injury included all injuries between fatal and minor. This class has now been divided into critical and serious to improve the usefulness of the statistics regarding the degree of injury.

Under "General Instructions" on OpNav Form 3750-8, are listed the events requiring a Medical Officer's Report. This list omits one listed under paragraph 28 of OpNav Instruction 3750.6A. This item is, "if the aircraft received strike or substantial damage", and it is necessary in order to evaluate accident causes, stresses, safety equipment, et cetera, in accidents where the Medical Officer's Report may otherwise not be required.

The flight surgeon is to be an additional member of the Aircraft Accident Board in every accident where there are injuries (treated or not), deaths, successful or attempted bailouts or ejections, ditchings and water crashes, or when circumstances are such as to require comment and recommendation regarding unusual or improper performance of personnel safety equipment (i.e., shoulder harness, oxygen equipment, exposure suits, et cetera), or about human engineering as related to the cockpit. This duty is not a passive one, but must be performed actively to the very best of the flight surgeon's ability. He must leave no stone unturned in his investigation of the aeromedical aspects of an accident.

Every medical department with a flight surgeon attached should make sure that their clerical office maintains a corrected copy of OpNav Instruction 3750.6A, has sufficient blank forms of OpNav 3750-8 and 3750-8A, and has a copy of Handbook for Aircraft Accident Investigation. These are musts if the flight surgeon is to investigate aircraft accidents satisfactorily.

The ultimate aim of preventive aviation medicine is the safe flight of the aircrew under operational conditions. To this end, the flight surgeon must apply his training and experience.

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Incentive-Hazard Duty Pay

The joint Navy-Air Force action to obtain incentive-hazard duty pay for MSC officers and enlisted personnel who act as inside observer-instructors of low-pressure chambers and subjects on acceleration devices has progressed rapidly and with heartening acceptance up to the House of Representatives Armed Forces Committee. It is reasonable to anticipate that this bill will be considered by the Committee early this fall and, if approved, will be enacted upon thereafter by the 84th Congress.

The proposed legislation would amend Section 204(a) of the Career Compensation Act, Public Law 351, enacted by the 81st Congress, to permit the two above-named categories of Armed Forces personnel to qualify for incentive-hazard duty pay.

The Navy Department, Department of Defense, and the Bureau of the Budget have approved this attempt to make the field of aviation physiology training and research more attractive, and it is encouraging to know that all who have had the opportunity to discuss the proposed amendment with those who are diligently working to get it before Congress agree that such a request for incentive-hazard duty pay is more than warranted. It is believed that this monetary reward will add impetus to the effectiveness of both the training and research programs in aviation physiology.

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